Taylor's & Maclaurin's

f(a+b) = f(a)+hf'(a)+$\frac{h^2}{2!}f''(a)+\cdots$+$\frac{h^n}{n!}f^n(a)$

Maclaurins Series

f(x) = f(0) +xf'(0)+$\frac{x^2}{2!}f''(0)+\cdots$+$\frac{x^n}{n!}f^n(0)$

1)e^x=1+x+$\frac{x^2}{2!}+\frac{x^3}{3!}+\cdots$

2)e^{-x}=1-x+$\frac{x^2}{2!}-\frac{x^3}{3!}+\cdots$

3)Sinx =x - $\frac{x^3}{3!}+\frac{x^5}{5!}-\frac{x^7}{7!}$+....

4)Cosx =1 - $\frac{x^2}{2!}+\frac{x^4}{4!}-\frac{x^6}{6!}+\cdots$

5)tanx= x + $\frac{x^3}{3!}+\frac{2x^5}{15}+\frac{17x^7}{315}$+....

6)Sinhx= x + $\frac{x^3}{3!}+\frac{x^5}{5!}+\frac{x^7}{7!}$+....

7)Cos(x)= 1 + $\frac{x^2}{2!}+\frac{x^4}{4!}+\frac{x^6}{6!}+\cdots$

8)tanhx= x - $\frac{x^3}{3!}+\frac{2x^5}{15}-\frac{17x^7}{315}$+....

9)log(1+x)= x $-\frac{x^2}{2}+\frac{x^3}{3}-\frac{x^4}{4}+\frac{x^5}{5!}-\cdots$

10)log(1-x)= - x $-\frac{x^2}{2}-\frac{x^3}{3}-\frac{x^4}{4}-\frac{x^5}{5!}-\cdots$

11) $\frac{1}{(1+x)} = 1-x+x^2-x^3+x^4 - ....$

12) $\frac{1}{(1-x)} = 1+x+x^2+x^3+x^4 +....$

13) $(1+x)^n=1+nx+\frac{n(n-1)x^2}{2!}+\frac{n(n-1)(n-3)x^3}{3!}+....$

Indeterminate Form's

Limit of form $\lim_{x\to a}\frac{f(x)}{g(x)}$ as $\frac{0}{0}$ which cannot be determined such limits are called as indeterminate form's.

1)L 'Hospital Rule

$\lim_{x\to a}\frac{f(x)}{g(x)} = \lim_{x\to a}\frac{f'(x)}{g'(x)}$ convert the given eq'n in $\frac{0}{0}$ form & then use L Hospital Rule

Limits Formula

1) $\lim_{x\to 0}\frac{sinx}{x} = 1$

2) $\lim_{x\to 0}\frac{tanx}{x} = 1$

3) $\lim_{x\to 0}\frac{sin^{-1}x}{x} = 1$

4) $\lim_{x\to 0}\frac{e^x-1}{x} = 1$

5) $\lim_{x\to 0}\frac{a^x-1}{x} = loga$

6) $\lim_{x\to 0}(1+x)^{1/x} = e$

7)log 0 =∞

8) log ∞ =∞

9)log 1=0

10)d(x^x)= x^x(1+log x)